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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,226	03/18/2005	Michel Magne	259346US0PCT	6706
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
WEDDELL, ALEXANDER MARION				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
09/12/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/510,226

Applicant(s)

MAGNE ET AL.

Examiner

ALEXANDER WEDDLE

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-19 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 11/26/2004; 01/30/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-15 and 19, drawn to a process for chemical treatment of lignocellulose material.

Group II, claim(s) 16-18, drawn to an article of comprising fibers of lignocellulose material made by the process.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the process of treating lignocellulose material is not a "special technical feature," because the process is known in the prior art (see Dawson, XP-002222940).

3. During a telephone conversation with Jacob Doughty on September 08, 2008 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-15 and 19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. The examiner has required restriction between product and process claims.

Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. "Chemical modification of wood by anhydrides without

solvents or catalysts" in view of Vaca-Garcia, C. et al. "Cellulose esterification with fatty acids and acetic anhydride in lithium chloride/N, N-dimethylacetamide medium."

Regarding Claims 1-2 and 4-7, Li et al. teach impregnating lignocellulose material ("wood" with an agent comprising hydrocarbonaceous chains (acetic, propionic, butyric, isobutyric, or hexanoic anhydride) (p. 216, left column, lines 32-40). The modified woods are characterized by weight gain and high resistance to water leaching (p. 217, left column, lines 3-24; p. 220, left column, line 15- right column, line 22). The agent is capable of providing covalent grafting of a plurality of hydrocarbonaceous chains to said materials by acetylation, propionylation, etc. (*id.*). Li fail to teach an agent which is a mixed anhydride comprising acetic/ octanoic acids or that the covalent grafting occurs through esterification. Li also fail to teach that the mixed anhydride comprises a first hydrocarbonaceous chain R and a second hydrocarbonaceous chain R₁, where R (or R₁) is represented by a C₂ to C₄ carboxylic acid and R₁ (or R) is represented by a C₆ to C₂₄ fatty acid and where those carboxylic acids and fatty acids are saturated or unsaturated.

Vaca-Garcia et al. teach that the agent which is capable of providing covalent grafting of hydrocarbonaceous chains to the cellulosic portion of lignocellulose may be a mixed anhydride (p. 315, right column, lines 17-20). Examiner takes official notice that lignocellulose is composed of cellulose, hemicellulose, and lignin bound together by hydrogen and covalent bonds. Vaca-Garcia teach an agent comprising mixed anhydrides, particularly of acetic and octanoic acids, which covalently graft a plurality of hydrocarbonaceous chains to the cellulose group of the lignocellulose material through

esterification (p. 315, right column, lines 17-20; p. 317, right column, lines 5-25). These mixed anhydrides confer high hydrophobicity and high mechanical resistance to the resulting cellulose ester material (p. 318, left column, lines 7-8; p. 319, left column, lines 9-11).

Vaca-Garcia et al. further teach a mixed anhydride with 1) a chain R, which represents a C₈ fatty acid, and 2) a COCH₃ chain, which represents a C₂ carboxylic acid (p. 315, right column, lines 5-16). It is Examiner's opinion that Claims 5 and 6 recite the identical compound with R and R₁ reversed.

It would have been obvious to a person of ordinary skill in the art at the time of invention to substitute the mixed anhydride of acetic acid/ octanoic acid as taught by Vaca-Garcia for the carbonaceous chains as taught by Li, because Vaca-Garcia teach that the mixed anhydride is capable of covalently bonding to the cellulose within lignocellulosic material to confer beneficial properties, including hydrophobicity and good mechanical resistance.

Regarding claim 3, Li further teach treating lignocellulose material between ambient and 150 °C (col. p. 217, left column, lines 3-24).

Regarding claims 8-11, Li disclose that despite their drawbacks, acidic and basic catalysts are widely used for the acetylation/ esterification of lignocellulose materials (i.e., wood treatment) (p. 215, right column, lines 23-29). Additionally, Li suggest that the process of esterification of wood without catalyst is limited because some anhydrides react slowly with wood (p. 221, right column, lines 8-10). Pyridine (a weak base) is one catalyst used in known wood treatments (p. 215, right column, line 28).

Moreover, Li teach that strong acid may result in damage to the wood structure (p. 215, right column, lines 25-27).

It would have been obvious to a person of ordinary skill in the art at the time of invention to use a weak base, known in the art to catalyze esterification reactions with lignocellulose, for the purpose of catalyzing an esterification reaction with lignocellulose with a reasonable expectation of success. Further, it would have been obvious to a person of ordinary skill in the art at the time of invention to try to use a weak acidic catalyst, because 1) there are a finite number of identified predictable solutions (no catalyst, strong basic catalyst, weak basic catalyst, strong acidic catalyst, weak acidic catalyst, or neutral catalyst) and 2) using a weak acidic catalyst would yield a reasonable expectation of success of increasing the rate of reaction while obviating damage to the wood structure. Likewise, it would have been obvious to a person of ordinary skill in the art at the time of invention to try to use a neutral catalyst, because 1) there are a finite number of identified predictable solutions (no catalyst, strong basic catalyst, weak basic catalyst, strong acidic catalyst, weak acidic catalyst, or neutral catalyst) and 2) using a neutral catalyst would yield a reasonable expectation of success of increasing the rate of reaction while obviating the problems identified in Li.

Regarding Claim 12, Li et al. teach impregnating the anhydrides by immersing (i.e. "dipping") the wood into the anhydrides (p. 216, left column, lines 38-39).

Regarding Claim 14 and 15, Li teach a method of treating wood pieces (30x30x5 mm) at reduced pressure and at higher than ambient temperature (p. 216, left column, lines 12-14, 36-42 and 44-52). Li fail to teach impregnating in an autoclave. It would

have been obvious to a person of ordinary skill in the art at the time of invention to use a known device, such as an autoclave, to heat a material at a given pressure in a known process, such as that taught by Li to yield predictable results.

Claims 1-12 and 14-15 are therefore *prima facie* obvious absent evidence to the contrary.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. "Chemical modification of wood by anhydrides without solvents or catalysts" in view of Vaca-Garcia, C. et al. "Cellulose esterification with fatty acids and acetic anhydride in lithium chloride/N, N-dimethylacetamide medium" as applied to claim 1 above, and further in view of Mahieu (EP 0190576).

The rejection of Claim 1 over Li et al. in view of Vaca-Garcia et al. as discussed in section 9 is incorporated herein.

Li et al. in view of Vaca-Garcia et al. further teach impregnating lignocellulose material (p. 216, left column, lines 38-39). Li et al. in view of Vaca-Garcia et al. fail to teach impregnating lignocellulose material by spraying. Mahieu ('576) teaches a method for treating building elements made out of wood (i.e., lignocellulose material) by spraying an excess of treatment liquid on the pieces to be treated (Abstract, lines 1-3; Claim 1).

It would have been obvious to a person of ordinary skill in the art at the time of invention to substitute a known technique for impregnating wood by spraying for a known technique of impregnating wood by immersion, or dipping, to yield predictable results.

Claim 13 is therefore *prima facie* obvious absent evidence to the contrary.

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. "Chemical modification of wood by anhydrides without solvents or catalysts" in view of Vaca-Garcia, C. et al. "Cellulose esterification with fatty acids and acetic anhydride in lithium chloride/N, N-dimethylacetamide medium" as applied to claim 15 above, and further in view of Dawson et al. "Reactivity of radiata pine sapwood towards carboxylic acid anhydrides" (Abstract).

The rejection of Claim 15 over Li et al. in view of Vaca-Garcia et al. as discussed in section 9 is incorporated herein.

Li et al. in view of Vaca-Garcia et al. teach chemically treating wood specimens obtained from hinoki (*Chamaecyparis obtuse*), a variety of cypress, which is from the order of conifers (p. 216, left column, lines 12-14).

Li in view of Vaca-Garcia fail to teach chemically treating pine or fir, (also from the order of conifers). Dawson et al. teach treating pine with carboxylic acid anhydrides to yield good durability towards decay and partial resistance to termite attack (Abstract).

It would have been obvious to a person of ordinary skill in the art at the time of invention to chemically treat pine with the process of Li in view of Vaca-Garcia, because Dawson teaches that pine can be successfully treated with carboxylic acid anhydrides to resist decay and termite attack.

It would have been obvious to a person of ordinary skill in the art at the time of invention to substitute one coniferous wood, hinoki, for another coniferous wood, pine or fir to yield predictable results of a hydrophobic, durable, decay resistant product.

Claim 19 is therefore *prima facie* obvious absent evidence to the contrary.

Conclusion

12. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER WEDDLE whose telephone number is (571) 270-5346. The examiner can normally be reached on Monday-Thursday, 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/
Supervisory Patent Examiner, Art
Unit 1792

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/A. W./
Examiner, Art Unit 1792